

CLAIMS

I claim:

1 1. A programmable, variable volume and pressure, coolant
2 supply system comprising:

3 at least one fluid pressure transducer for monitoring coolant
4 pressure;

5 a pump for providing coolant to at least one tool with at
6 least one coolant orifice means, the orifice means having a flow
7 area;

8 an electrical AC pump motor operatively connected to said
9 pump;

10 a variable frequency drive electrically connected to said pump
11 motor, said variable frequency drive providing AC power to said
12 pump motor at various frequencies, to thereby control a speed of
13 said pump motor; and

14 a computer, said computer monitoring the coolant pressure via
15 said at least one fluid pressure transducer and being programmed
16 with data related to the flow area of the orifice means; and
17 wherein

18 said computer determines a desired speed of said pump motor
19 based on the coolant pressure and the flow area of the orifice
20 means of the tool;

21 said computer controlling the variable frequency drive to
22 provide said pump motor with AC power at a frequency that results
23 in said pump motor running at the desired speed.

1 2. The coolant supply system as defined in claim 1, further
2 comprising a coolant supply line, said coolant supply line
3 extending between said pump outlet and the orifice means, to supply
4 said coolant under pressure to the orifice means.

1 3. The coolant supply system as defined in claim 2, further
2 comprising a coolant return line, said coolant return line
3 extending between the tool and said pump inlet, for returning said
4 coolant to said pump inlet after said coolant exits the orifice
5 means.

1 4. The coolant supply system as defined in claim 3, further
2 comprising a coolant reservoir in said coolant return line.

1 5. The coolant supply system as defined in claim 4, further
2 comprising a coolant catch pan between the tool and said coolant
3 return line, said coolant catch pan receiving said coolant exiting
4 the orifice means and directing it into said coolant return line.

1 6. The coolant supply system as defined in claim 5, further
2 comprising a coolant filter in said catch pan, to remove impurities
3 from said coolant exiting the orifice means prior to directing said
4 coolant into said coolant return line.

1 7. A fluid cooled, cutting tool system comprising at least
2 one cutting tool having a coolant orifice means with a flow area
3 for applying a coolant to said at least one tool, and a
4 programmable, variable volume and pressure, coolant supply system,
5 said coolant supply system comprising:

6 at least one fluid pressure transducer for monitoring the
7 pressure of said coolant;

8 a pump having an inlet and an outlet, for providing
9 pressurized coolant to said coolant orifice means;

10 an electrical AC pump motor operatively connected to said
11 pump;

12 a variable frequency drive electrically connected to said pump
13 motor, said variable frequency drive providing AC power to said
14 pump motor at various frequencies, to thereby control a speed of
15 said pump motor; and

16 a computer, said computer monitoring said coolant pressure via
17 said at least one pressure transducer, and being programmed with
18 data related to said flow area of said coolant orifice means; and
19 wherein

20 said computer determines a desired speed of said pump motor
21 based on said coolant pressure and said flow area of said orifice
22 means;

23 said computer controlling said variable frequency drive to
24 provide said pump motor with AC power at a frequency that results
25 in said pump motor running at said desired speed.

1 8. The fluid cooled, cutting tool system as defined in claim
2 7, wherein:

3 said coolant orifice means includes a plurality of orifices;

4 said flow area is a total flow area of said plurality of
5 orifices; and

6 said computer determines said desired speed of said pump motor
7 based on said coolant pressure and said total flow area of the
8 plurality of orifices.

1 9. The fluid cooled, cutting tool system as defined in claim
2 8, further comprising a coolant supply line, said coolant supply
3 line extending between said pump outlet and said orifice means, to
4 supply said coolant under pressure to said orifice means.

1 10. The fluid cooled, cutting tool system as defined in claim
2 9, further comprising a coolant return line, said coolant return
3 line extending between said at least one tool and said pump inlet,
4 for returning said coolant to said pump inlet after said coolant
5 exits said orifice means.

1 11. The fluid cooled, cutting tool system as defined in claim
2 10, further comprising a coolant reservoir in said coolant return
3 line.

1 12. The fluid cooled, cutting tool system as defined in claim
2 11, further comprising a coolant catch pan between said at least
3 one tool and said coolant return line, said coolant catch pan
4 receiving said coolant exiting said orifice means and directing it
5 into said coolant return line.

1 13. The fluid cooled, cutting tool system as defined in claim
2 12, further comprising a coolant filter in said catch pan, to
3 remove impurities from said coolant exiting said orifice means
4 prior to directing said coolant into said coolant return line.

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